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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/663,805	09/17/2003	Sang Hyun Kim	8733.913.00-US	3765

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EXAMINER
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GOUDREAU, GEORGE A

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 10/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/663,805

Applicant(s)

KIM, SANG HYUN

Examiner

George A. Goudreau

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on (9-17-03' to 4-21-05').
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No: \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

*George A. Goudreau*  
GEORGE GOUDREAU  
PRIMARY EXAMINER

10-051

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date, \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

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1. Claims 1-23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- The wording used throughout claims 6, 19, and 23 is written in a very confusing manner, and should be reworded.;

- The usage of the term "predetermined" in the claims is vague, and indefinite.

- The scope of the preamble in claim 1 is not commensurate with the body of claim 1. (The preamble recites a method for forming a thin film transistor. The body of the claim does not positively recite a sufficient number of steps for forming a thin film transistor.); and

- The scope of the preamble in claim 14 is not commensurate with the body of claim 14. (The preamble recites a method for forming a thin film transistor. The body of the claim does not positively recite a sufficient number of steps for forming a thin film transistor.)

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claim 14 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by Hirabayashi et. al. (JP 2000-040,828).

Hirabayashi et. al. disclose a process for polysi thin film transistor which is comprised of the following steps:

- A gate oxide layer (i.e.-buffer layer) (12) is formed onto the surface of a CZ-Si wafer.;
- An amorphous Si layer is formed onto the surface of the gate oxide layer. (12);
- The amorphous Si layer is converted to a polysi layer (13) by laser annealing the amorphous Si layer.;
- The polysi layer (13) is cmp polished to remove protrusions on the surface of the polysi layer as well as reduce the thickness of the polysi layer.;
- The polysi layer is patterned using photo etching process to produce a barrier layer (15).;
- A gate insulator layer (19) is conformably formed onto the surface of the wafer.;
- and
- A gate layer is formed onto the surface of the gate insulating layer to form a gate (17).

This is discussed specifically in the abstract; and discussed in general on pages 1-4. This is shown in figures 1-3.

4. Claim 14 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by Shibuya et. al. (JP 10-200,120).
5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 15-18, and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied in paragraphs 3 or 4 above further in view of Takagi (JP 2002-006,338).

The references as applied in either paragraphs 3 or 4 above fail to disclose the following aspects of applicant's claimed invention:

- the usage of a excimer type layer to re-crystallize the amorphous Si layer in the processes, which are taught above;
- the formation of the amorphous Si layer to the specific thicknesses, which are claimed by the applicant;
- the etching of the polysi layer to the specific thicknesses which are claimed by the applicant; and
- the etching back of the polysi layer to remove the protrusions on the surface of the polysi layer

Takagi teaches that it is desirable to use a plasma etch back process to flatten the surface of a polysi layer on a wafer. This is discussed specifically in the abstract; and discussed in general in 1-5. This is shown in figures 1-11.

It would have been obvious to one skilled in the art to employ a plasma etch back process to remove the protrusions on the surface of the polysi layer of the device fabricated in any of the processes which is taught above based upon the following. Takagi teaches that it is desirable to do such. Further, this would simply represent the usage of an alternative, and at least equivalent means for conducting the removal of the

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protrusions on the polysi layer in the processes, which are taught above to the specific means, which are taught above.

It would have been obvious to one skilled in the art to employ an excimer laser to conduct the thermal annealing (i.e.-re-crystallization) of the amorphous Si layer in any of the processes, which are taught above based upon the following. The usage of an excimer laser to conduct a thermal annealing process is conventional or at least well known in the semiconductor processing arts. (The examiner takes official notice in this regard.) Further, this would simply represent the usage of an alternative, and at least equivalent means for conducting the thermal annealing in any of the processes, which are taught above to the specific means, which taught above.

It would have been obvious to one skilled in the art to thin the polysi layer in the process, which is taught above to the specific thicknesses, which are claimed by the applicant based upon the following. It would have been desirable to thin or etch the polysi to a sufficient thickness to adequately remove all of the polysi protrusions without removing an excessive amount of the polysi layer, which would adversely effect the electrical properties of the fabricated device.


It would have been desirable to form the amorphous Si layer in any of the processes, which are taught above to the specific thicknesses, which are claimed by the applicant based upon the following. It would have been desirable to form an adequate thickness of this conductive layer of the device to meet the needed current carrying capacity for this device without forming an excessively thick layer of amorphous Si, which would waste both precious process time, and process materials.

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7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

8. Any inquiry concerning this communication should be directed to examiner

George A. Goudreau at telephone number (571)-272-1434.

  
George A. Goudreau  
Primary Examiner  
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